

MALAYSIAN PARASITES VII

NEW GENERA AND SPECIES, APPARENTLY OF APOLONIINAE (ACARINA, LEEUWENHOEKIIDAE), FROM THE ASIATIC-PACIFIC REGION

By

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The subfamily Apoloniinae was established in 1947 by Wharton to include the genera *Apolonia* Torres and Braga and *Womersleyia* Wharton. His diagnosis of the subfamily was as follows: "Trombiculids with seven segments on all legs, one seta on coxae I, an anterior-median projection of the scutum, stigma and tracheae present, numerous ventral setae between the posterior coxae, and the posterior lateral scutal setae not on the scutum."

Wharton, aided by Fuller (1952, p. 90) later included *Sauracarella* Lawrence 1949, and gave the following diagnosis: "Trombiculids whose larvae have all legs composed of seven segments, and have paired, submedian, anterior, scutal setae, or an anterior, median, scutal projection or both. Sensillae expanded or attenuated."

In the present paper, the writer includes six additional genera, *Cockingsia* nov., *Audyana* nov., *Mackerasiella* nov., *Grossia* nov., *Nothotrombicula* Dumbleton and *Womersleyia* Radford. This is a heterogeneous assemblage of genera, but on larval characters they would be included in an expanded subfamily Apoloniinae, a concept which the writer believes to be useful at the present stage of knowledge. A clear line cannot at present be drawn between the Leeuwenhoekiidae, a family largely founded on larval characters, and the Trombidiidae, largely founded on adult characters. Until such time as the species discussed below are reared to the nymphs and adults, and comparisons made with related members of the Trombidiidae, placing them in the Apoloniinae *sensu lato* must be regarded as no more than tentative. This opportunity is nevertheless taken to describe these genera and species so that they will be available for consideration while our understanding of the Leeuwenhoekiidae is developing. The genus *Audyana* nov., for example, was at first considered as most nearly related in the larval stage to the Apoloniinae, but nymphs which have subsequently been bred show that this is a Trombelline genus near *Trombella*, in the family Trombidiidae. The relationships between such genera and those of the Apoloniinae require a great deal of study.

Key to Genera of Larvae from the Asiatic-Pacific region

1. Legs I 7-segmented, II and III 6-segmented, tarsal claws simple, no empodium. 2
Legs all 7-segmented. Tarsal claws variable 4
2. Scutum triangular, with pronounced snout-like anterior process bearing the two AM setae. Setae on coxae II and III and on femur of palpi normal. Sensillae filamentous and nude. Palpal claw bifurcate, tarsus small.
Gen. Cockingsia nov.
Scutum without any anterior process 3
3. Scutum wider than long, more or less rectangular. Coxae II and III as well as maxillae and femora of palpi with short claviform peg-like setae. AM and AL setae also claviform and peg-like. Sensillae long and narrowly lanceolate with fine indistinct ciliations. Palpal tarsus apically with 2 long strong spines.
Gen. Audyana nov.

Scutum longer than wide, tongue-shaped with additional setae behind PL; AM absent; SB wide apart and near to AL. No coxal, palpal or scutal peg-like spines as in above. Sensillae long and fine, nude. Palpal tarsus long, with two strong terminal spine-like setae. Chelicerae short and hook-like

Gen. *Mackerrasiella* nov.

4. Tarsal claws single, without empodium 5
Tarsal claws paired, with median empodium; PL setae placed on scutum 6

5. Scutum with pronounced antero-median process, bearing 2 AM setae; AL and PL setae strongly dentate; with an aberrant crista. Sensillae filamentous and nude. Palpal claw bifurcate and strongly hook-like.

Gen. *Neotrombidium* Leonardi 1901
= *Monunguis* Wharton 1938. (*Adult*)*

Scutum without anterior median process or crista. AM absent. AL and PL normal with short ciliations. Sensillae ciliated distally. Tarsi with a pair of spatulate setae flanking claw. Palpal claw with 4 strong sickle-like prongs.

Gen. *Grossia* nov.

6. Without AM setae. Scutal setae normal. Coxal setae short, stout and peg-like.

Gen. *Nothotrombicula* Dumbleton 1947.

With 2 AM setae. Scutal setae fairly short, stout and peg-like with fine distal barbs. Coxal setae normal.

Gen. *Womersleyia* Radford 1946.

Genus *Nothotrombicula* Dumbleton 1947

Trans. roy. Soc. N.Z., 1947, 76, 41.

Scutum with anterior median process but no anterior median setae. Sensillae long and filamentous and nude. Tarsi with paired claws and median claw-like empodium; legs all 7-segmented; coxae I with 2, II and III with 1 short, stout, peg-like setae.

Type *Nothotrombicula deinacridae* Dumbleton.

Nothotrombicula deinacridae Dumbleton 1947 (figs. 1 A-H).

Trans. roy. Soc. N. Z., 1947, 76, 411, figs. 8-10.

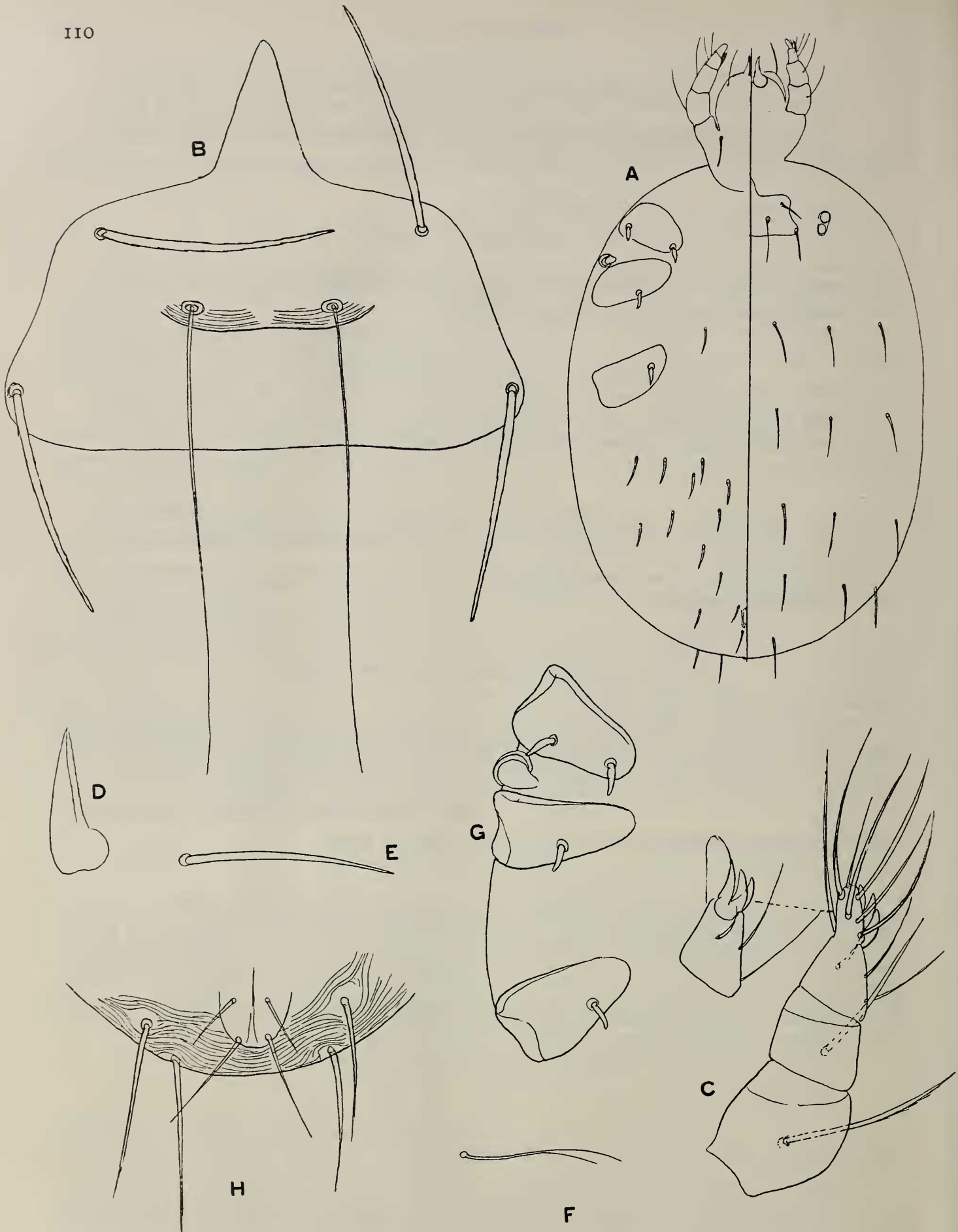
Redescription of Larvae.—Size large, oval; length to 1200 μ , width to 660 μ . Scutum as figured, transverse with PW greater than AW, and with an acute triangular antero-median process; AM wanting, AL and PL subequal, sensillae filamentous, nude, and bases slightly in front of midline between AL and PL, with a line posterior and fine transverse striations between. Eyes 2+2. Chelicerae with teeth? Galeal setae? Palpi rounded laterally, tibial claw short, stout, trifurcate; seta on femur lightly ciliated apically, genu and tibia all nude; tarsus small. Dorsal setae stout, only slightly ciliated, tapering, 26 in number and arranged 6.6.6.6.2. Ventrally, with a pair of normal setae on maxillae, 2 short peg-like setae on coxae I, one similar seta on coxae II and III, a pair of normal setae between coxae III and therefore 10.6.2.2.2. plus 2 stout spines on lobes of anus. Legs: I 200 μ long, II 185 μ , III 180 μ .

The Standard Data for the type and 2 paratypes as given by Dumbleton are :

AW 105.0, 105.0, 105.0, PW 155.1, 161.7, 165.0, SB 42.9, 49.5, 49.5,
ASB 49.5, 49.5, 49.5, PSB 42.9, 42.9, 42.9, A-P 50.4, 56.1, 59.4,
AL 75.9, 72.6, 82.5, PL 82.5, 82.5, Sens. 138.6, 141.9, 155.1.

Loc. and Host.—This very interesting genus and species was described from specimens parasitic on the Giant Weta or King Cricket of New Zealand (*Deinacrida rugosa*?) from Mt. Peel, Nelson, New Zealand.

* The genus *Neotrombidium* is based on adult material (genotype *Neotrombidium barringtonense* Hirst, 1928). *Monunguis* Wharton, 1947, was based on larvae. In correspondence with me, and in a brief note (1947) Wharton has indicated the synonymy of *Monunguis* with *Neotrombidium*. The nearest relatives of this genus are the genera here placed in the Apoloniinae. For the sake of completeness and for comparison with the others, *Neotrombidium* is provisionally included in the above Key under the characters of the larvae of *Monunguis* syn. Discussion of this genus is however reserved for a subsequent paper.



1. *Nothotrombicula deinacridae* Dumbleton, 1947

A, dorsal and ventral halves of larva; B, scutum ($\times 500$); C, palp; D, chelicer; E, dorsal seta; F, maxillary seta; G, left coxae; H, apex of abdomen ventrally. (Mainly after Dumbleton).

Remarks.—The author compares the genus with *Hemitrombicula* Ewing, but as Wharton has shown, the latter is not in any way associated with the Trombiculids. The closest relationship of *Nothotrombicula* is with the various genera of the subfamily Apoloniinae, but it is near to *Audyana* n. gen. in the form of the scute, yet differs in the leg-segmentation, the form of the AL scutal setae, and the absence of any AM.

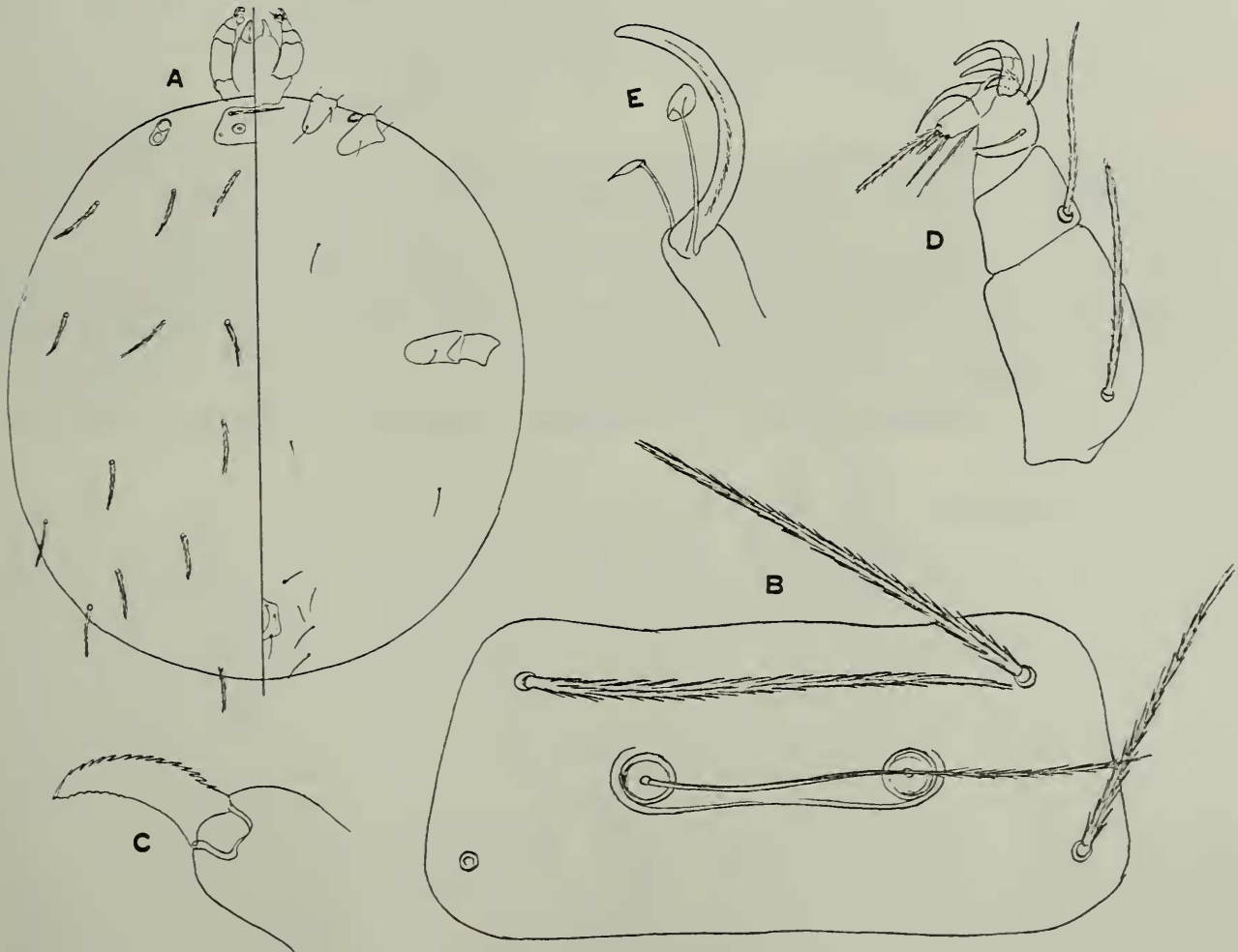
Genus **Grossia** nov.

Belonging to the subfamily Apoloniinae *sensu lato* of the Leeuwenhoekiidae, and distinguishable by the absence of AM scutal setae, by the tarsi of all legs being furnished with a single claw, and by a pair of shorter apically spatulate tenent setae.

Type *Grossia onychia* n. sp.

Remarks.—As given in the generic diagnosis this remarkable genus appears to belong to the subfamily Apoloniinae of the Leeuwenhoekiidae in that all the legs are 7-segmented. It comes closest to the genus *Neotrombidium* but differs from this and all other genera of the family in the absence of the AM scutal setae and the presence of paired spatulate setae on each tarsus at the base of the single claw, a feature common to the Tetranychidae, but hitherto unknown in the Trombiculidae or Leeuwenhoekiidae.

The genus is dedicated to the finder.



2. *Grossia onychia* n. gen., n. sp.

A, dorsal and ventral halves of larva; B, scutum ($\times 450$); C, chelicer; D, palp; E, tip of tarsus.

Grossia onychia n. sp. (figs. 2 A-E).

Description of Larva.—Size large, length (engorged) 1500 μ ; width 1300 μ . Shape like a small pea. Colour in life? Scutum as figured, large, triangular, with apex pointing forwards; AM setae absent, AL setae behind the midlength; PL near the posterior corners; sensillae in between AL and PL, very long and moderately thick, with short adpressed barbs or ciliations on distal half; AL and PL setae long, thick and shortly ciliated or barbed. Eyes 2+2, on ocular shield, and nearer to lateral body margins than to scutum. Chelicerae as figured, with a few fine teeth distally on inner (dorsal) edge, and fine teeth all the length of outer edge. Galeal setae short and simple. Palpi as figured, tibiae with curved short bifurcate claw; setae on femur and genu, thick and shortly ciliated; setae on tibia and tarsus not ascertainable. Dorsal setae thick and shortly ciliated, arising from small platelets, 26 in number, arranged 6.6.6.6.2. from 156 μ long anteriorly to 195 μ long posteriorly. Ventrally, a pair of short setae anteriorly on maxillae, a pair of short setae on coxae I, and one seta on each of coxae II and III, a pair of short apparently simple setae between coxae III and thereafter 4 setae, followed by five setae on each side of anus; these ventral setae gradually lengthening and apparently nude. The anus is furnished with two pairs of setae. Legs all 7-segmented, I 540 μ long, II 540 μ , III 600 μ ; tarsi I and II without any dorsal rod-like seta, III without any long nude seta; all tarsi furnished with a single strong claw, on each side of which is a shorter spatulate seta.

The Standard Data for the type are :

AW 100.0, PW 156.0, SB 73.0, ASB 143.0, PSB 20.0, SD 163.0, A-P 55.0.
AL 112.0, PL 84.0, Sens. 168.0.

Loc. and Host.—A single specimen attached to an adult Trombidiid (*Chyzeria australiense* Hirst) from the Ottway Ranges, Victoria, 1951 (*G. F. Gross*).

Genus Mackerrasiella nov

Shape globose, with leg I 7-segmented, II and III 6-segmented, tarsal claws single, no empodium. Scutum ill defined, overlapped with longitudinal striations, with no AM, 2 AL and 2 PL and two small additional setae at posterior end; sensillae filamentous. Eyes 2+2, widely separated and posterior the smaller. Chelicerae hook-like.

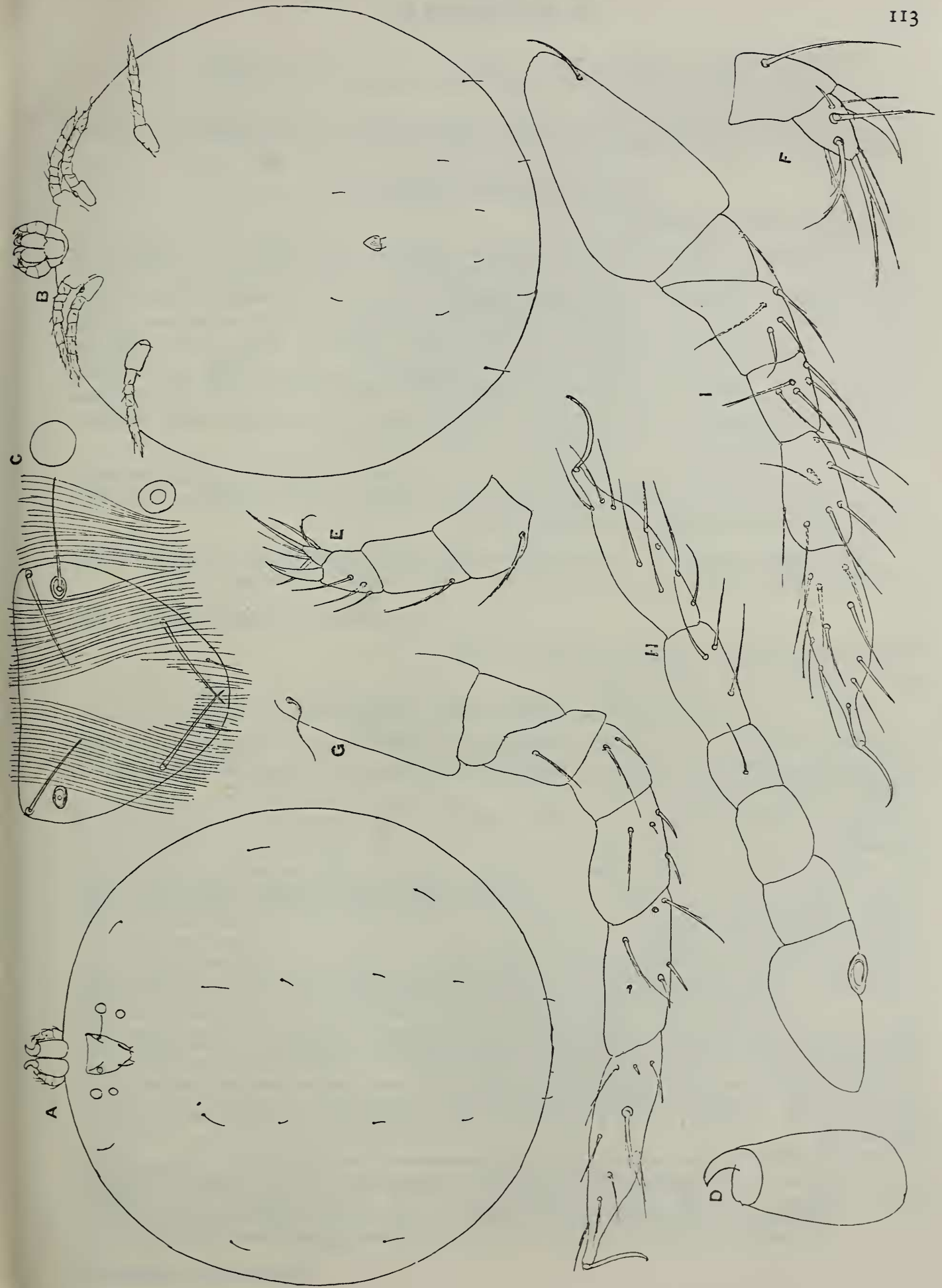
Type *Mackerrasiella globus* n. sp.

Remarks.—In the segmentation of the legs this new genus may be placed in the subfamily Apoloniinae of the Leeuwenhoekidae, which already contains rather a heterogeneous collection of genera. In the absence of AM scutal setae, and the slight posterior prolongation of the scutum and the additional two small posterior setae it might equally well be placed in the Gahrlepiinae of the Trombiculidae. The presence of single tarsal claws, however, also allies it with the Apoloniinae. Altogether its true relation is obscure and will remain so until it becomes possible to correlate the larvae with nymphs or adults.

This genus is dedicated to Mrs. J. M. Mackerras, Parasitologist, Queensland Institute of Medical Research.

Mackerrasiella globus n. sp. (figs. 3 A-I).

Description of Larvae.—Shape globose, when mounted and compressed perfectly round. Length of idiosoma (engorged) 845 μ , width 845 μ . Scutum small, margins ill defined, and overlapped by longitudinally striated cuticle; no AM setae present, anterior margin between AL lightly concave; sensillae filamentous, apparently nude and bases close to AL, wide apart, SB being only a little less than distance between AL; PL still nearer together; scutum posteriorly behind PL with two short fine additional setae, 11 μ long; scutal setae apparently nude. Eyes large, 2+2, widely separated and posterior the smaller, anterior in line with SB, and posterior about in line with PL, posterior eye with strongly refringent centre. Mandibles large, with the chelicerae hook-like and non-serrate. Galeal setae? Palpi as figured, tibial claw bifurcate; setae on femur and genu relatively short with short indistinct barbs, on tibia all 3 setae nude, tarsus rather long and cylindrical, with a long strong apical seta, and no sensory rod, as figured. Dorsal setae sparse and apparently nude; two humeral setae 45 μ long, then a row of four 51 μ long, followed by submedial 20 μ long, then four of which the laterals are 45 μ long and the submedials 20 μ , then two submedials 20 μ long, and apically two more 20 μ long. Ventrally: apparently no setae on maxillae, one short seta on the tip of the evanescent coxae I, none on coxae II and one short seta towards apex of coxae III; no setae between any coxae; a pair of short 20 μ setae in front of anus; anus itself on a small triangular shield and carrying two small setae; behind anus 8 small setae. No true spiracles between gnathosoma and coxae I apparent. Legs relatively short, I 7-segmented, II and III 6-segmented; leg I 240 μ long, II 195 μ long, III 208 μ , long; tarsal claws only one, and no empodium present; setae of specialised nature on legs as follows: I, 2 genulae and 1 micro-genuala, 2 tibialae and 1 microtibiala, 1 tarsala and 1 microtarsala; II, one tarsala only; III with two femoralae, one whip-like mastigenuala; no sensory rod on any tarsi.



3. *Mackerrasiella globus* n. gen., n. sp.
 A, dorsum, and B, venter, of larva; C, scutum and eyes ($\times 530$); D, chelicer; E, palp; F, palpal tibia and tarsus further enlarged; G, leg I; H, leg II; I, leg III.

The Standard Data for the type are :

AW 70.0, PW 42.0, SB 61.6, ASB 14.0, PSB 58.8, SD 72.8, A-P 50.42.

AL 30.8, PL 29.4, Sens. 33.6.

Loc. and Host.—Described from the type and paratype attached to two Dolichopodid flies collected in a light trap at Merbein, Victoria, 2.xii, 1951. (*Mrs J. M. Mackerras*).

Genus *Womersleyia* Radford 1946

Parasitology, 1946, 37, 48-51, figs. 19-23.

Re-diagnosis of Genus.—Leeuwenhoekiiidae, subfamily Apoloniinae, with legs all 7-segmented. Tarsal claws paired, with median empodium. With 2 AM setae present and PL on the scutum. Scutum with strong antero-median conical process on which are the two AM setae. Scutal setae stout and spine-like with distal fine ciliations, but PL not so stout as AM and AL. Sensillae fine and filamentous, with fine distal ciliations. Palpal claws single but bifid and deeply cleft, short and curved; tarsus terminating in two stout, straight spines or setae with fine distal ciliations; as well as several long finely ciliated setae. Chelicerae short and curved, non-serrate, with a small apical tricuspid cap. Eyes 2+2, on ocular shields, posterior the smaller, and placed close to posterolateral corners of scutum.

The above re-diagnosis of the genus is based on a paratype specimen kindly given to me by Dr. Radford, and takes into account the various characters now considered of generic importance in the taxonomy of this family of mites.

Both Radford and R. F. Lawrence, 1949, placed the genus in the Leeuwenhoekiiinae Womersley 1944, but it more naturally belongs to the subfamily Apoloniinae.

Type *Womersleyia minuta* Radford, 1946.

Womersleyia minuta Radford, 1946 (figs. 4 A-G).

Parasitology, 1946, 37, 51, fig. 19-23.

This very interesting species was described from specimens at first collected from mud in a Pandanus swamp from Gan Island, Addu Atoll, in the Maldives, 20. xii. 1944, and later found to be parasitic under the wings of grasshoppers belonging to the three families Acrididae, Tetrigidae and Tettigoniidae.

The following re-description is from a specimen from grasshoppers given to me by Dr. Radford.

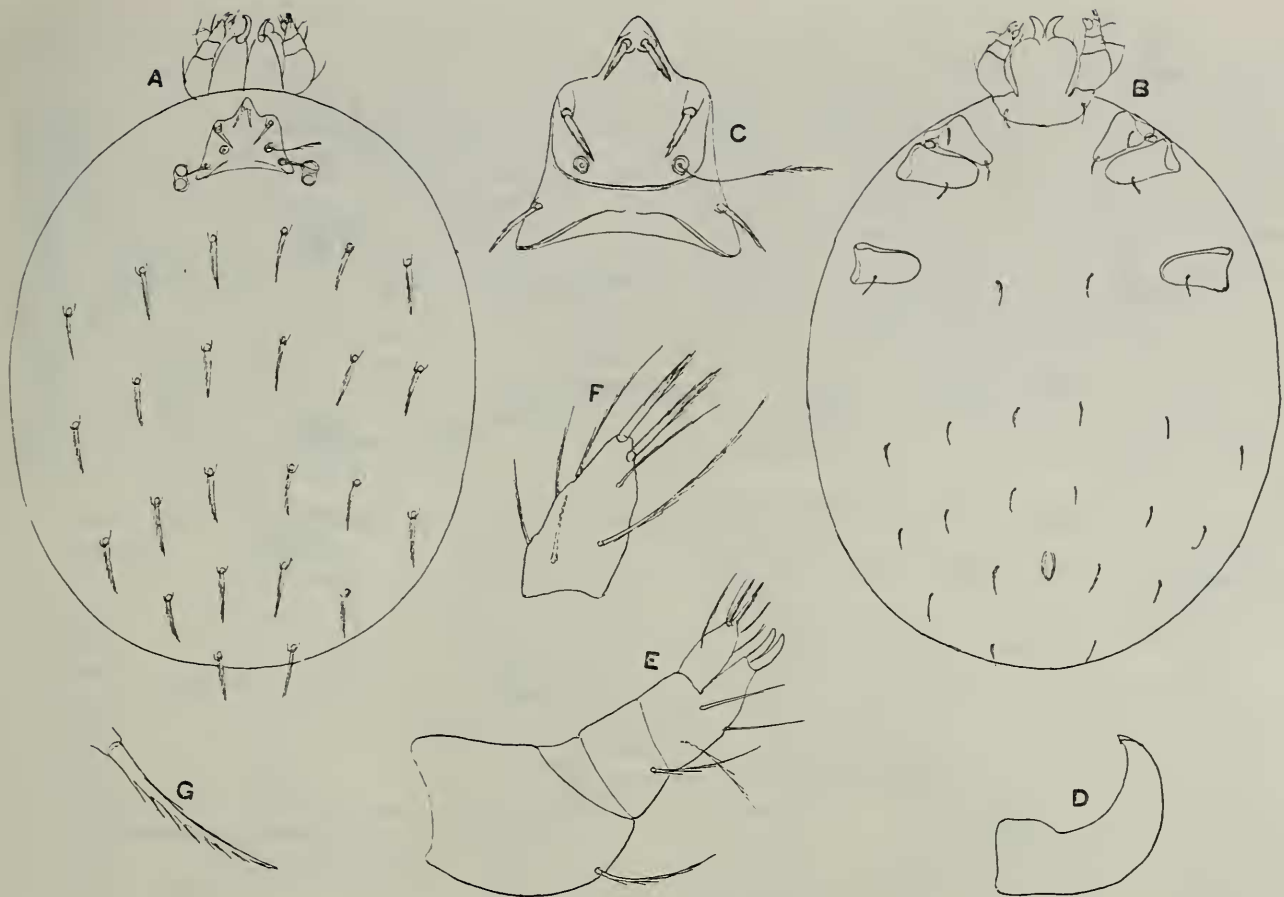
Re-description of Larvae.—Shape oval. Colour in life reddish: Length (engorged) 400 μ , width 335 μ . Scutum as figured, wider between PL than between AL; anteriorly with a strong and pronounced conical process which carries the two AM setae; postero-lateral corners produced, and posterior margin lightly concave; the scutal setae are short, stout and spine-like with short fine distal ciliations and arise from strong tubercles; sensillae fine and filamentous, ciliated distally with the bases in a line midway between lines of AL and PL; from the antero-lateral corners a strong line runs posteriorly to behind the sensillae bases, and from the posterior corners also a strong line runs anteriorly meeting and thinning out medially in line of PL. Eyes 2+2, large and on ocular shields close to the postero-lateral corners of the scutum. Chelicerae small, but rather strongly curved, non-serrate, with only an apical tricuspid cap. Galeal setae nude. Palpi stout, tibial claw rather short, bifid, nude and deeply cleft and lightly curved; setae on palpal femur and genu fine and shortly ciliated, on tibia, only the ventral branched; the tarsus with a pair of strong thick apical spines or setae which are distally finely ciliated; as well as several normal long and ciliated setae. The dorsal setae are 6.6.6.4.2. to 34 μ long. Ventrally, with a pair of ciliated setae on maxillae, two on coxae I, and one on coxae II and III, a pair between coxae III, and thereafter ca. 6.6.4.2. varying from 17 μ anteriorly to 24 μ posteriorly. Legs: I 188 μ long, II 160 μ , III 206 μ ; no long nude setae on tarsi or metatarsi III.

No trace of trachea or true spiracles between gnathosoma and coxae I.

The Standard Data for the above paratype compared with those given by Radford (in parentheses) are:

AW 33.5 (34.0), PW 50.25 (55.0), SB 26.8 (34.0), ASB, to base of process 23.45, to apex of process 39.85 (40.0), PSB 23.45 (17.0), SD to base of process 46.9, to apex of process 63.3 (60.0), A-P 26.85 (25.0), AM 13.4 (17.0), AL 16.75 (17.0), PL 16.75 (20.0), Sens. 33.5 (51.0).

STUD. INST. MED. RES.



4. *Womersleyia minuta* Radford, 1945

A, dorsum, and B, venter, of larva; C, scutum ($\times 390$); D, chelicer; E, palp; F, palpal tarsus further enlarged; G, dorsal seta.

Genus *Cockingsia* nov.

With the characters of the Leeuwenhoekidae, subfamily Apoloniinae, with leg I 7-segmented and legs II and III 6-segmented. Scutum roughly triangular with apex anterior as a pronounced process carrying the two AM setae. Tarsal claws single, no empodium. Coxae I with 2 setae. Palpi, except the femur, cylindrical; tibia with paired or bifurcate strong and slightly curved claws, tarsus normal and small. Scutal setae stiff, rod-like and minutely serrate. Stigmata and tracheae present.

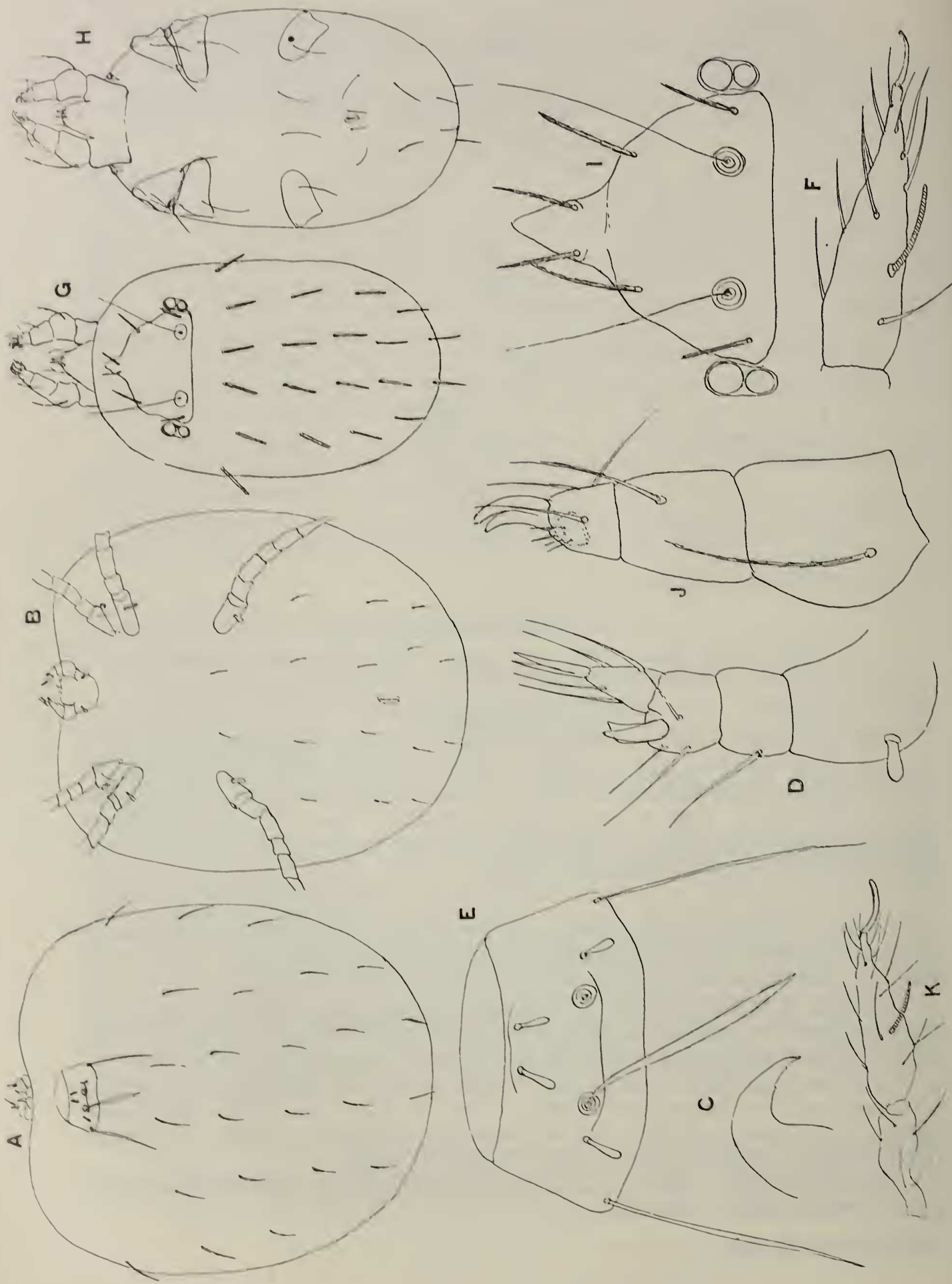
Type *Cockingsia tenuipes* n. sp.

Remarks.—This genus which in the form of the scutum is closely related to *Audyana* n. g., *Womersleyia* Radford and *Neotrombidium* Leonardi (= *Monunguis* Wharton) is dedicated to Mr. K. L. Cockings, a former member of the Colonial Office Unit in Malaya.

The genus is perhaps nearest to *Neotrombidium* (*Monunguis*) in having single tarsal claws and nude filamentous sensillae, but differs in the legs II and III being only 6-segmented, and in the less curved palpal claws, as well as in the absence of any sign of an incipient crista.

In the leg segmentation it agrees with *Audyana* n. gen., but differs in the form of the scutal setae, and in having single tarsal claws, as well as in the form of the setae on the maxillae and on coxae II and III. Also the palpal tarsus is normal and without the terminal spines of *Audyana*, and the palpal claws are not short and stumpy.

From *Womersleyia* it differs in the single tarsal claws, and the more specialised palpal tarsus, as well as the leg segmentation.



5. *Audyana thompsoni* n. gen., n. sp.
 A, dorsum, and B, venter, of larva; C, tip of chelicera; D, palp;
 E, scutum ($\times 500$); F, tarsus I.

Cockingsia tenuipes n. gen., n. sp.
 G, dorsum, and H, venter, of larva; I, scutum ($\times 500$); J, palp;
 K, tibia and tarsus I.

Cockingsia tenuipes n. sp. (figs. 5 G-K).

Description of Larvae.—Shape oval but with sides somewhat flattened and when fully engorged with a slight medial constriction. Length (unfed) 260μ , width 156μ ; fully engorged, to 715μ , and 480μ respectively. Scutum roughly triangular with apex directed forward as an anterior median process bearing the 2 AM setae; sensillae filamentous and nude, their bases large, widely separated and in line of PL; scutal setae stiff and rod-like with indistinct serrations. Eyes 2+2, large, on ocular shields and closely adjacent to postero-lateral corners of scutum. Chelicerae small, non-serrate, and with only the apical cap. Galeal setae short, fine and nude. Palpi as figured, femur outwardly slightly rounded with a long shortly ciliated seta; genu cylindrical with a nude seta, tibia short with all 3 setae nude, and a bifurcate strong slightly curved claw; tarsus small with fine non-specialised setae. Dorsal setae short from 32μ anteriorly to 42μ posteriorly, rod-like with indistinct serrations, 20 in number, and arranged 2.4.4.4.4.2. Ventrally, no setae could be observed on the maxillae; coxae I with 2 long fine setae, II and III with 1 such seta; a pair between coxae III and then 4.2.2.2., the median two the first four being close to the anus, and varying in length from 16μ anteriorly to 39μ posteriorly. Legs long and unusually slender, I (to tip of claw) 312μ , II 312μ , III 338μ ; tarsi I and II with sensory rod, III without any long nude seta; claws long, curved and single. Empodium absent. Spiracle between gnathosoma and coxae I present, but only beginning of tracheae observed.

The Standard Data for the type (unfed) and 13 paratypes (fully engorged) are as follows :

	Mean.	Standard Deviation.	Theoretical Range.	Observed Range.	Coeff. of Variation.
AW	... 44.6 ± 0.55	... 2.04 ± 0.39	... 38.5-50.7	... 42.0-47.6	... 4.6
PW	... 71.6 ± 0.64	... 2.38 ± 0.45	... 64.45-78.75	... 67.2-75.8	... 3.3
SB	... 42.4 ± 0.50	... 1.86 ± 0.35	... 36.8-48.0	... 39.2-44.8	... 4.4
ASB	... 67.2		No variation recorded.		
PSB	... 14.0		No variation recorded.		
SD	... 81.2		No variation recorded.		
A-P	... 36.2 ± 0.46	... 1.72 ± 0.33	... 31.0-41.4	... 33.6-39.2	... 4.8
AM	... 29.8 ± 0.47	... 1.77 ± 0.33	... 24.5-35.1	... 25.2-30.8	... 6.0
AL	... 33.0 ± 0.52	... 1.96 ± 0.37	... 27.1-38.9	... 28.0-36.4	... 5.9
PL	... 22.6 ± 0.20	... 0.75 ± 0.14	... 20.35-24.85	... 22.4-25.2	... 3.3
Sens	... 75.6		No variation recorded.		

Loc. and Host.—This genus and species is described from specimens taken from the wings of a giant longicorn beetle from Sungei Buloh, Selangor, Malaya, 17. viii. 1948. (*J. R. Audy*).

Remarks.—The affinities of this species are discussed under the generic description.

Family TROMBIDIIDAE Leach, 1815

Subfamily TROMBELLINAE Thor, 1935

Genus *Audyana* nov.

Scutum somewhat rectangular, with 2 AM, 2 AL, and 2 PL setae, of which the AM and AL setae are modified to form short claviform organs, the AL being situated in line with sensillae bases and lateral to these, but nearer than to the lateral margins; PL setae long and normal but mid-shaft very slightly thickened; sensillae long and narrowly lanceolate with fine indistinct ciliations; anterior scutal margin concave, without median process, but extending in front and the whole way across is a wide more or less hyaline part with its anterior margin flattened (whether this is the anterior part of the scutum is uncertain). Legs: I 7-, II and III 6-segmented, tarsi furnished with only a single claw, and no empodium; coxae I with 2 fine, ciliated normal setae, II and III with 1 short claviform setae as in AM and AL; palpi stout, tibial claws short, equal, stumpy; maxillae and femora with a stout short claviform seta, genu with a long straight nude seta; tibia with 3 setae nude and straight; tarsus conical over-reaching claws, and apically with 2 long strong spines and with 4 to 5 nude setae. Chelicerae strongly curved, in addition to a minute apical cap, with two small subapical dorsal teeth. Galeal setae ?absent. Eyes apparently absent. No stigmata and tracheae observed. Dorsal and ventral setae tapering, short and indistinctly ciliated.

In the general conformity of the scutum this genus might have come in the subfamily Apoloniinae of the Leeuwenhoeekiidae, particularly in having leg I 7-segmented. It differs from the other genera of the subfamily in that *only* Leg I is 7-segmented. In the palpal claws it resembles *Womersleyia* Radford, and in the single tarsal claws it closely resembles to *Neotrombidium* Leonardi (*Monunguis* Wharton).

Nymphs of this species have however been bred by Messrs. Lee Fatt-Hing and Aman bin Mahmood of the Colonial Office Research Unit, and these are clearly related to *Trombella* Berl. in the subfamily Trombellinae. A description of the nymph, together with a review of the whole subfamily, is to be published elsewhere.

The genus is named after Dr. J. R. Audy, leader of the British Colonial Office Research Unit in Malaya.

Type *Audyana thompsoni* n. sp.

***Audyana thompsoni* n. sp. (figs. 15 A-F).**

Description of Larvae.—Size (engorged) to 650 μ , width to 450 μ . Shape oval. Legs: I 285 μ long, II 235 μ , III 260 μ . Scutum as figured with paired AM, AL and PL setae and 2 sensillae; anterior margin concave, apparently without any median process, but with a deep hyaline band extending the whole width of scutum; AM and AL setae modified to short claviform bodies, and AL not at the antero-lateral corners but placed close to, lateral to and in line with sensillae bases; PL long and very narrowly lanceolate; sensillae longer and distinctly lanceolate. Eyes apparently absent. Palpi stout, tibia with two short straight claws, maxillae and femora with short claviform setae; genu with a long nude seta; tibia with 3 nude setae; tarsus conical over-reaching tibial claws, with two long straight apical spines and 4 or 5 straight nude setae. Chelicerae strongly curved, with a minute spical tricuspid cap, and two small subapically dorsal teeth. Dorsal seta tapering, finely but indistinctly ciliated, arranged 2.6.6.4.4.2 to 58 μ long. Ventrally, 2 fine ciliated setae on coxae I, a single claviform seta on coxae II and III, a pair of fine ciliated setae between coxae III, then 4.4.4.2 setae. Legs: I 7-segmented, II and III 6-segmented; all tarsi with only a single claw; no long nude seta on tarsi III.

THE STANDARD DATA FOR 8 SPECIMENS ARE :

	Mean.	Standard Deviation.	Theoretical Range.	Observed Range.	Coeff. of Variation.
AWS† ...	71.05+1.05	2.97+0.74	62.15-79.95	70.0-78.4	4.1
AW† ...	57.05+0.74	2.08+0.52	50.8-63.3	36.0-61.6	3.6
PW ...	93.4+0.94	2.65+0.66	85.4-101.4	89.6-98.0	2.8
SB ...	33.6+0.53	1.50+0.37	29.1-38.1	30.8-36.4	4.4
ASB ...	30.45+0.35	0.99+0.25	27.5-33.4	28.0-30.8	3.2
PSB ...	16.8		No variation recorded		
SD ...	47.25+0.35	0.99+0.25	44.3-50.2	44.8-47.6	2.1
(A-P)S† ...	37.1+0.70	1.98+0.49	31.2-43.0	33.6-39.2	5.3
AM ...	11.2		No variation recorded		
AL ...	11.2		No variation recorded		
PL ...	84.0+1.59	4.49+1.12	70.5-97.5	78.4-89.6	5.3
Sens. ...	76.3+2.10	4.2+1.48	63.7-88.9	70.0-78.4	5.5

Loc. and Host.—Eight specimens (C.O.R.U. 4244-7) taken from the venter of the common giant black scorpion, *Heterometrus longimanus* (No. R 6049), Pahang Road, Ulu Gombak Forest Reserve, Selangor, Malaya, 14.iv.1949 (*J. R. Audy*). Many more specimens have been collected since.

Remarks.—This species is named for Lieut.-General Sir Treffry O. Thompson, K.C.S.I., C.B., C.B.E., K.H.P., D.M., D.P.H., formerly Director of Medical Services, Allied Land Forces, South East Asia, in recognition of his great encouragement of research on Scrub Typhus during World War II.

Audyana thompsoni is reported to occur in small numbers, usually attached near the pecten, on nearly half the specimens of *Heterometrus* collected from forest in Selangor. As already noted, nymphs have been bred out, enabling the species to be placed in the Trombellinae.

† In the above, AWS is the anterior width of the scutum, and AW is the width between the transposed AL setae/measured as defined for the Standard Data. Similarly (A-P)S is the distance between the antero-lateral corners of the scutum and the PL bases.

Summary

Three new genera and species, *Cockingsia tenuipes*, *Grossia onychia* and *Mackerrasiella globus* are described and their affinities are considered to be closest with the Apoloniinae Wharton. The genera *Nothotrombicula* and *Womersleyia* are re-described together with their type species, and likewise ascribed to the Apoloniinae.

Five genera are thus provisionally placed in the Apoloniinae pending further studies of related species as well as of nymphal and adult stages.

Another new genus and species, *Audyana thompsoni*, is described and placed in the family Trombidiidae, subfamily Trombellinae, with a note on the general affinities of the larva with the Apoloniinae.

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